Figure 1

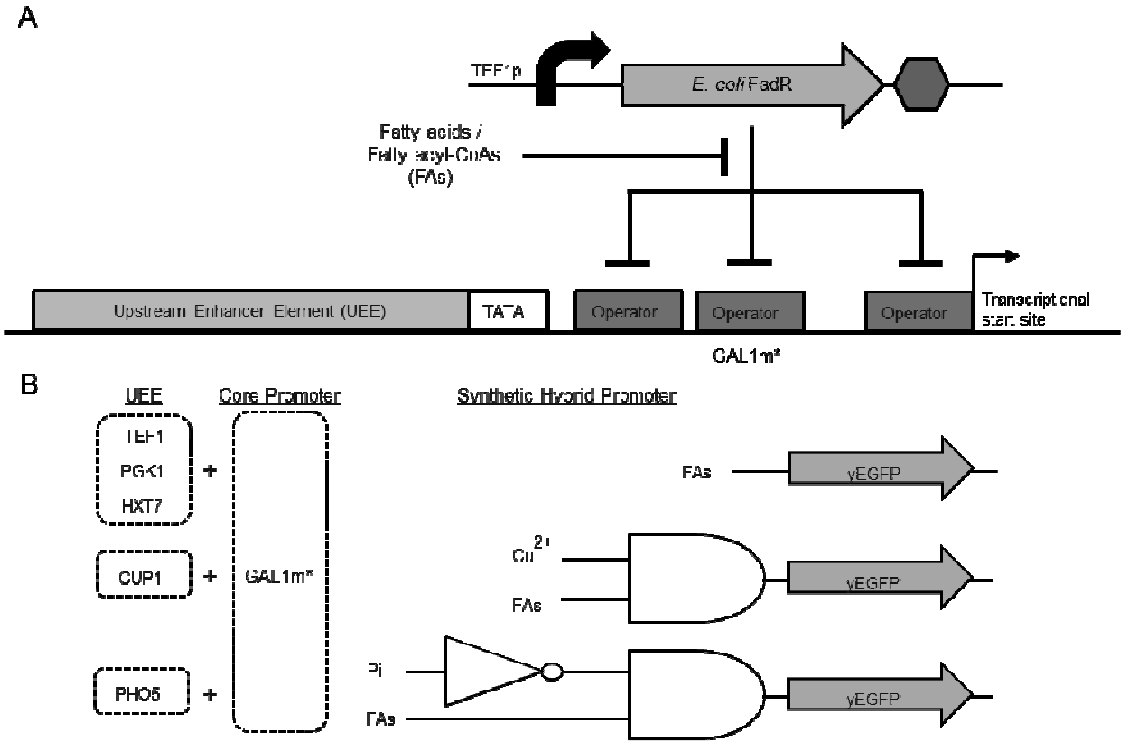

A
TEF1p
E. coli FadR
Fatty acids / Fatty acyl-CoAs (FAs)
Upstream Enhancer Element (UEE)
TATA
Operator
Operator
Operator
Transcriptional start site
GAL1m*
B
UEE
Core Promoter
Synthetic Hybrid Promoter
TEF1
PGK1
HXT7
CUP1
PHO5
GAL1m*
FAs
yEGFP
Cu2+
FAs
yEGFP
Pi
FAs
yEGFP

Figure 2

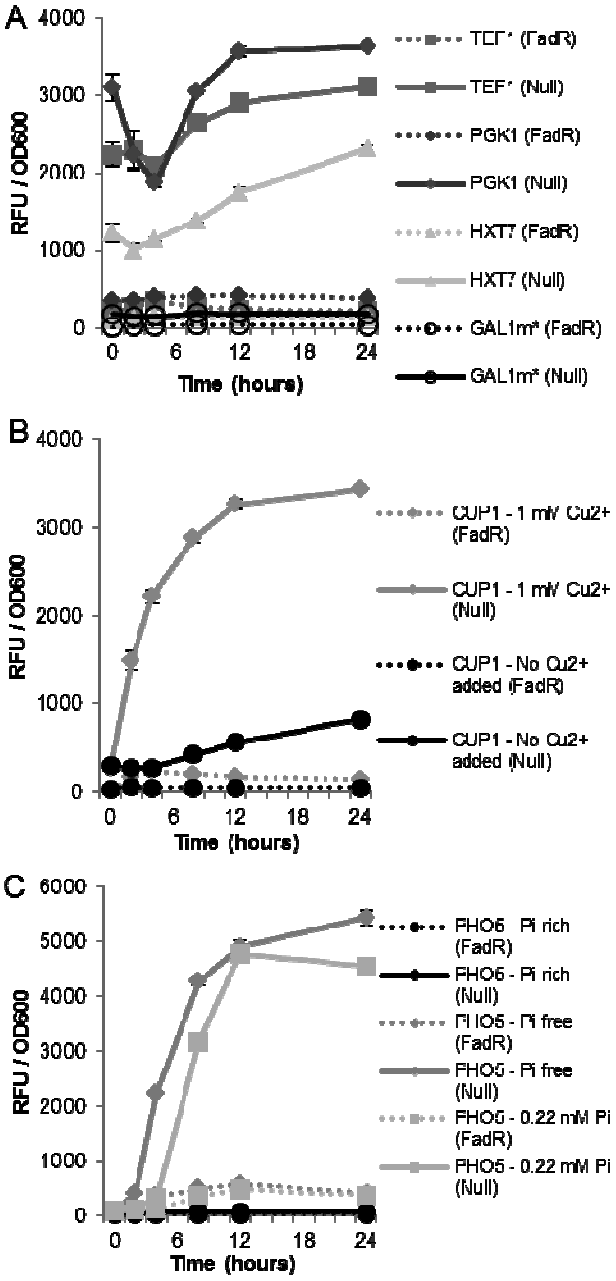

A
4000
3000
2000
1000
0
RFU / OD600
0
6
12
18
24
Time (hours)
TEF1 (FadR)
TEF1 (Null)
PGK1 (FadR)
PGK1 (Null)
HXT7 (FadR)
HXT7 (Null)
GAL1m* (FadR)
GAL1m* (Null)
B
4000
3000
2000
1000
0
RFU / OD600
0
6
12
18
24
Time (hours)
CUP1 - 1 mM Cu2+ (FadR)
CUP1 - 1 mM Cu2+ (Null)
CUP1 - No Cu2+ added (FadR)
CUP1 - No Cu2+ added (Null)
C
6000
5000
4000
3000
2000
1000
0
RFU / OD600
0
6
12
18
24
Time (hours)
PHO5 Pi rich (FadR)
PHO5 - Pi rich (Null)
PHO5 - Pi free (FadR)
PHO5 - Pi free (Null)
PHO5 - 0.22 mM Pi (FadR)
PHO5 - 0.22 mM Pi (Null)

Figure 3

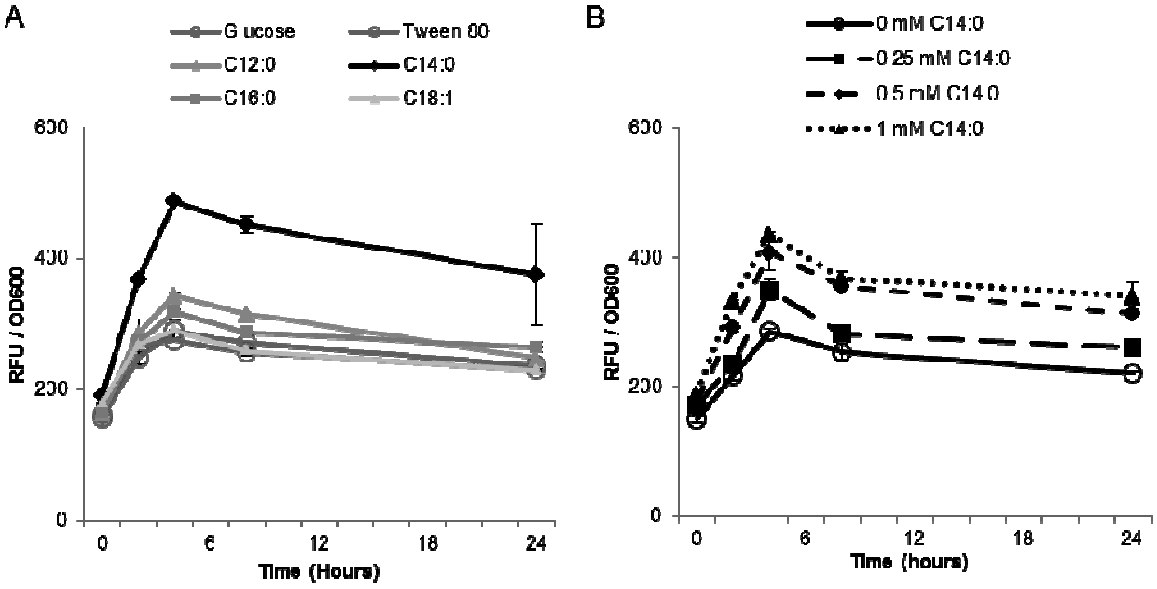


Figure 4

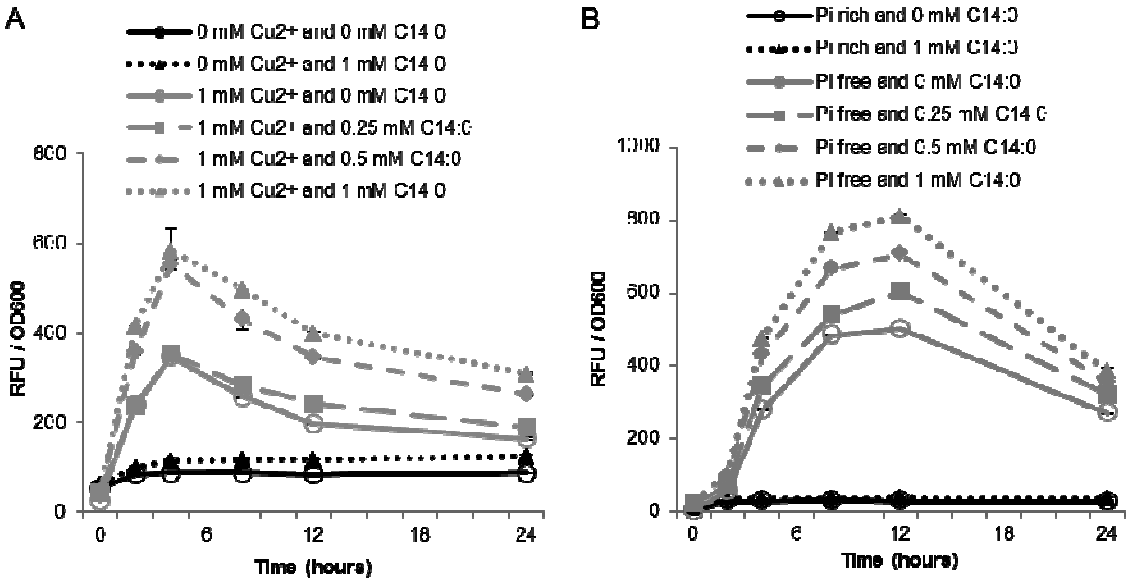


Figure 5

DNA Part	Inclusive basepairs (5' of start codon)	Length (bp)	Reference
GAL1m*	-147 to -1	147	This work
UEE (TEF1)	-401 to -198	204	(Blazeck et al. 2012)
UEE (PGK1)	-982 to -152	831	This work
UEE (HXT7)	-587 to -168	420	This work
UEE (CUP1)	-456 to -143	314	This work
UEE (PHO5)	-400 to -102	299	This work

Figure 6

DNA Part	Seq ID No.	Sequence (5' to 3') *FadR operator sites shown in bold.
GAL1m*	3	TATATAAATGGATCTGCT**ATCTGGTACGACCAGAT**AAT**ATCTGGTA CGACCAGAT**TTTGTATTACTTCT**ATCTGGTACGACCAGAT**AGTATC AACAAAAAATTGTTAATATACCTCTATACTTTAACGTCAAGGAGAAA AAACTATA
UEE (TEF1)	4	ATGTTTCTACTCCTTTTTTACTCTTCCAGATTTTCTCGGACTCCGCG CATCGCCGTACCACTTCAAAACACCCAAGCACAGCATACTAAATTT CCCCTCTTTCTTCCTCTAGGGTGTCGTTAATTACCCGTACTAAAGG TTTGGAAAAGAAAAAAGAGACCGCCTCGTTTCTTTTTCTTCGTCGA AAAAGGCAATAAAAATTTT
UEE (PGK1)	5	GAAGTACCTTCAAAGAATGGGGTCTCATCTTGTTTTGCAAGTACCA CTGAGCAGGATAATAATAGAAATGATAATATACTATAGTAGAGATAA CGTCGATGACTTCCCATACTGTAATTGCTTTTAGTTGTGTATTTTTA GTGTGCAAGTTTCTGTAAATCGATTAATTTTTTTTTCTTTCCTCTTTT TATTAACCTTAATTTTTATTTTAGATTCCTGACTTCAACTCAAGACG CACAGATATTATAACATCTGCACAATAGGCATTTGCAAGAATTACTC GTGAGTAAGGAAAGAGTGAGGAACTATCGCATACCTGCATTTAAA GATGCCGATTTGGGCGCGAATCCTTTATTTTGGCTTCACCCTCATA CTATTATCAGGGCCAGAAAAAGGAAGTGTTTCCCTCCTTCTTGAAT TGATGTTACCCTCATAAAGCACGTGGCCTCTTATCGAGAAAGAAAT TACCGTCGCTCGTGATTTGTTTGCAAAAAGAACAAAACTGAAAAAA CCCAGACACGCTCGACTTCCTGTCTTCCTATTGATTGCAGCTTCCA ATTTCGTCACACAACAAGGTCCTAGCGACGGCTCACAGGTTTTGTA ACAAGCAATCGAAGGTTCTGGAATGGCGGGAAAGGGTTTAGTACC ACATGCTATGATGCCCACTGTGATCTCCAGAGCAAAGTTCGTTCGA TCGTACTGTTACTCTCTCTCTTTCAAACAGAATTGTCCGAATCGTGT GACAACAACAGCCTGTTCTCACACACTCTTTTCTTCTAACCAAGGG GGTGGTTTAGTTTAGTAGAACCTCGTGAAACTTACATTTACATA
UEE (HXT7)	6	CCGTGGAAATGAGGGGTATGCAGGAATTTGTGCGGGGTAGGAAAT CTTTTTTTTTTTTAGGAGGAACAACTGGTGGAAGAATGCCCACACT TCTCAGAAATGCATGCAGTGGCAGCACGCTAATTCGAAAAAATTCT CCAGAAAGGCAACGCAAAATTTTTTTTCCAGGGAATAAACTTTTTAT GACCCACTACTTCTCGTAGGAACAATTTCGGGCCCCTGCGTGTTC TTCTGAGGTTCATCTTTTACATTTGCTTCTGCTGGATAATTTTCAGA GGCAACAAGGAAAAATTAGATGGCAAAAAGTCGTCTTTCAAGGAAA AATCCCCACCATCTTTCGAGATCCCCTGTAACTTATTGGCAACTGA AAGAATGAAAAGGAGGAAAATACAAAATATACTAGAACTGAAAAAA AAAAAG
UEE (CUP1)	7	TCCCATTACCGACATTTGGGCGCTATACGTGCATATGTTCATGTAT GTATCTGTATTTAAAACACTTTTGTATTATTTTTCCTCATATATGTGT ATAGGTTTATACGGATGATTTAATTATTACTTCACCACCCTTTATTT CAGGCTGATATCTTAGCCTTGTTACTAGTTAGAAAAAGACATTTTTG CTGTCAGTCACTGTCAAGAGATTCTTTTGCTGGCATTTCTTCTAGA AGCAAAAAGAGCGATGCGTCTTTTCCGCTGAACCGTTCCAGCAAA AAAGACTACCAACGCAATATGGATTGTCAGAATCA
UEE (PHO5)	8	TTTTCTTTGTCTGCACAAAGAAATATATATTAAATTAGCACGTTTTC GCATAGAACGCAACTGCACAATGCCAAAAAAAGTAAAAGTGATTAA AAGAGTTAATTGAATAGGCAATCTCTAAATGAATCGATACAACCTT GGCACTCACACGTGGGACTAGCACAGACTAAATTTATGATTCTGGT CCCTGTTTTCGAAGAGATCGCACATGCCAAATTATCAAATTGGTCA CCTTACTTGGCAAGGCATATACCCATTTGGGATAAGGGTAAACATC TTTGAATTGTCGAAATGAAACG

Figure 7

Common name	Chemical structure	*C*:*D*
caprylic acid	$CH_3(CH_2)_6COOH$	8:0
capric acid	$CH_3(CH_2)_8COOH$	10:0
lauric acid	$CH_3(CH_2)_{10}COOH$	12:0
myristic acid	$CH_3(CH_2)_{12}COOH$	14:0
palmitic acid	$CH_3(CH_2)_{14}COOH$	16:0
stearic acid	$CH_3(CH_2)_{16}COOH$	18:0
arachidic acid	$CH_3(CH_2)_{18}COOH$	20:0
behenic acid	$CH_3(CH_2)_{20}COOH$	22:0
lignoceric acid	$CH_3(CH_2)_{22}COOH$	24:0
cerotic acid	$CH_3(CH_2)_{24}COOH$	26:0